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AUTHOR Emans, Robert L.; Milburn, Corinne M.
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ABSTRACT

An overview is presented of results of process-product research into the relationship between teacher behavior and student achievement. Results of studies are summarized, focusing mainly on teacher behaviors in the areas of: (1) management of time; (2) structuring and presenting lessons; and (3) questioning techniques. Research results on classroom management are also reviewed and discussed. This research focused on how effective teachers organize and manage an efficient classroom, give students tasks at the appropriate level, focus on worthwhile academic objectives, and use a balanced approval to motivate students. A discussion is presented of the findings of research studies on whole class instruction versus group and individual discussion, the classroom climate, and teachers' expectations for students. More than 100 research studies are cited in the references. (JD)

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THE KNOWLEDGE BASE OF TEACHING

A Review and Commentary of Process-Product Research

by

Robert L. Emans
Corinne M. Milburn

School of Education
The University of South Dakota
Vermillion, South Dakota

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INTRODUCTION

Good teachers can, and do, make a difference. But what is it that good teachers do that help their students learn? The answers to this question are complex, and in same ways elusive (Olson, 1988). Nevertheless, answers, if only partial answers, do exist. The past twenty years has seen a dramatic explosion in the knowledge related to teaching.

The body of shared understandings about teaching is commonly referred to as "the knowledge base." Olson (1988) defines it as, "the store of understanding that the profession has available to inform, guide, and illuminate practice" (p. 7). Stated somewhat differently, Valli and Tom (1988) believe the knowledge base to be, "the entire repertoire of skills, information, attitudes, etc., that teachers need to carry out their classroom responsibilities" (p. 5).

Various authors (Olson, 1988; Shulman, 1987) have attempted to be more specific and have tried to identify aspects, or domains, of the knowledge base. Their conclusion has been that there is no <u>one</u> knowledge base, but many knowledge <u>bases</u>. Among the domains are the following:

-- content, or subject matter, knowledge
-- general principals of teaching that cut across subject-matter lines, or general pedagogical knowledge
-- principles of teaching that are related to a specific subject matter, or specific pedagogical knowledge
-- how students learn and develop knowledge
-- principles of classroom managerial and organization knowledge
-- curriculum knowledge

-- social/political educational knowledge

-- educational values and goals knowledge.

The knowledge base includes more than principles gleaned from research, but also includes insights that only wisdom, experience, moral principles, values, and sensitivity can provide. The knowledge base depends upon what is being taught, where, and to whom (Schulman 1987, Olson, 1988). As Henderson (1988) states, "We must function without the assurance of an indisputable, definitive body of knowledge" (p. 13).

Dewey's (1986) insight was that findings from research could help teachers be more observant, flexible, and responsible to the needs of students. In a similar vein, Brophy and Good (1986) believe:

> Effective instruction involves selecting (from a large repertoire) and orchestrating those teaching behaviors that are appropriate to the context and to the teacher's goals, rather than mastering and consistently applying a few "generic" teaching skills (p. 360).

Ayers (1988) warns us:

> While a knowledge base constructed on the findings of recent research on teaching promises to create a more powerful practice, it may just as easily narrow our concept of teaching to those acts and behaviors that researchers find interesting, important, or researchable (p. 27).

Thus, there is danger in defining the knowledge base too broadly or too narrowly -- so broadly that nothing is excluded and little direction for practice is given, or so narrowly that valuable information is not considered (Ayers, 1988). Nevertheless, the practical consideration for this report is that its scope must be limited and its parameters defined. A major consideration must be how, and for what purpose, the report will be used. Keeping this in mind, the results of the report are to be used primarily for students preparing to be teachers in many disciplines and at various grade levels. Likewise, the results will be

used in courses focusing primarily on the observation of teaching. It is believed, therefore, legitimate to decide to narrow the scope of this report to the results of what has become to be known as process-product research.

A rationale for this decision is needed. A brief description of this type of research, how it came about, and its strengths and limitations will be provided at this time.

PROCESS-PRODUCT RESEARCH

Process-product research relates teacher behavior to student achievement. It focuses on the teacher as the vehicle of instruction, on the measurement of teacher behavior by trained observers, on elementary and secondary classrooms, and on teacher behaviors that apply to several subject matter areas.

Process-product research attempts to answer the question, "How does teaching behavior contribute to a rise in standardized test scores?" This type of research is in contrast to previous research comparing teaching methods and research comparing teacher personality or traits. Research on teaching methods also attempted to answer the above question, but for various reasons, which will be made clearer in the following paragraphs, failed to do so. Research on teacher personality or traits (such as appearance, intelligence, leadership, and enthusiasm) used ratings by supervisors or principals which were found to have little relationship to how such students actually learned. There have been attempts at still other types of research, but, although they have promise, are still in the formulative stage, or do not have a direct

bearing on the observation of teaching. Thus, they are outside the scope of this project.

Limitations of Process-Product Research

Product-process research has definite limitations. As an outgrowth of behavioral psychology, it describes what happens, but seldom gives an explanation as to why. This makes it difficult to communicate the significance of the findings and for teachers to relate how the results might influence their behavior. As Gage (1986) has pointed out, using the results from process-product research should not mean that teachers stop thinking about what they are doing.

Another limitation of process-product research is that it can best investigate educational objectives involving factual knowledge and comparatively simple skills which can be taught specifically and measured by rather straight forward tests. It does not often study the learning of complex thoughts, feelings, and behaviors (Stallings, Needles, & Stayrook, 1979).

Using process-product methodology, educational researchers have moved away from conducting experimental studies and toward correlational studies. The reason is fairly simple. In a single correlational study, hundreds of variables can be studied. For example, Rosenshine (1976) selected, using his own subjective judgement, just six relationships out of several hundred potential correlations in the studies he reviewed. Yet, as Gage concludes, "It seems safe to assume that the true relationship, if any, between any single dimension of teacher behavior and pupil achievement or attitude is probably low" (Gage, 1978, p. 230). It may be that the apparent success of product-process studies, in

contrast to the previous studies on teaching methodology, is due more to the research techniques used (correlational vs. experimental) and not the importance of what is being investigated. A review of process-product research raised the question: "Are we preventing change in classroom teaching behaviors by introducing change only according to what we study?" (Emans & Fox, 1974, p. 58). Process-product research may be getting the results that it is only because it is looking for what it is finding. The influence of educational research may be a product of investigator bias. As Goodlad has said:

> Much of western society is thinking narrowly about its schools, following a period of inflated expectation. Schools have overreacted in part because these more limited expectations are easier to meet than are the existential demands of the badly-needed reforms (Goodlad, 1979, p. 412).

Some of the perhaps most significant variables cannot be investigated through process-product research, e.g., the use of a simplified orthography for beginning reading instruction. Likewise, it has never been demonstrated that children must learn skills in the first and second grades in order for them to learn successfully at subsequent levels. Perhaps other primary goals are more important, e.g., those dealing with classification and measurement, as stressed in the British infant schools.

Although schools have been more successful in recent years than they were in the past in teaching rudimentary skills, there is evidence from the National Assessment of Educational Progress evaluation that schools continue not to be able to help pupils achieve better in more complex thought processes (NAEP, 1981). Medley cautions that:

> But teachers are not hired to cram information into students' heads to be retained just long enough to enable them to pass objective tests. Teachers are hired to educate children, to produce important, lasting changes in their

> behavior, not short-term changes in test scores.... There is no evidence that teachers adept in producing quick gains are also effective in producing permanent, important changes in pupils (Medley, 1979, p. 17).

There is no attempt, or desire, in this report to defend such concepts as open education, informal education, or individualized instruction. Yet, too many investigators seem to have equated these practices with lack of discipline, teacher and pupil socializing, and teachers grading papers during class time (Corno, 1979). It might be fruitful to compare well-structured and implemented programs of open or informal education with other types of education. Rosenshine (1976) has made such a proposal. Walker and Schaffarzick (1974) reviewed twenty-three studies of what they called "new" and "traditional" curriculum. Their conclusion was similar to Rosenshine's who concluded, "Each curriculum seemed to be most effective when the post-test included the type of content emphasized in that curriculum" (Rosenshine, 1976, p. 349). Peterson reviewed research studies on open and traditional programs. She concluded, "With traditional teaching, students tend to perform slightly better on achievement tests, but they do worse on tests of more abstract thinking" (Peterson, 1979, p. 63).

As Doyle has said:

> A student may...make little effort to acquire problem solving skills if the academic task can be accomplished by simply recalling solutions arrived at by the teacher or by other students in class (Doyle, 1979, p. 141).

Finally, the major concern is that educators seem to have been very quick to generalize, perhaps overgeneralize, from process-product findings. Process-product research has generally been conducted in the early grades, on low socioeconomic status children, and involved the measurement of relatively simple behaviors. There is little evidence to

suggest that the conclusions should be generalized to other parts of the curriculum, to other grade levels, or to children of different socioeconomic status (Brophy, 1979; Good, 1979). As Rosenshine has said, "The extent to which these generalizations need to be modified as one serves to other grade levels and contexts remains to be determined" (Rosenshine, 1976, p. 364). Brophy and Evertson (1974) found opposite results for high socioeconomic groups from those for low socioeconomic groups. Medley raised the concern that "Most of the behaviors are found to be ineffective with pupils of high socioeconomic status, and vice versa" (Medley, 1979, p. 22). A number of studies (Evertson, Anderson & Brophy, 1978; McConnell, 1977; Stallings, Needels & Stayrook, 1979) showed that the research evidence could be used with good results, but "only to the extent that basic skill mastery is the primary goal" (Brophy, 1979). There is considerable evidence that effective teaching does vary from content to content (Powel, 1979). Shulman (1974) calls for subject-matter specific researches on teaching.

With these limitations in mind, the results from product-process research will be summarized and their significance reported. The reader will be reminded periodically of limitations of the findings.

RESEARCH FINDINGS

An apparent foreshadowing of the findings of later research were the early conclusions of Harris and Serwer (1966) and of Chall and Feldmann (1966). They found that teachers whose behaviors were most characteristic of a selected approach in teaching helped children learn more. Good and Grouws (Good, 1979) reported similar results from a

study conducted in 1979. Soar (1968) concluded that beginning skills are learned best through direct teaching.

The findings of process-product research have been summarized by Brophy and Good (1986) as, "Achievement is maximized when teachers emphasize academic instruction as a major part of their own role, expect their students to master the curriculum, and allocate most of the available time to curriculum-related activities" (p. 360).

Effective teachers are task-centered, move at a relatively fast pace, and present information actively and clearly (Good, Grouws, & Ebmeier, 1983; Good, 1983). They limit student decision making, choices, socialization, and nonacademic activities (Good, 1983; Stallings, Needels, & Stayrook, 1979; Medley, 1977).

Rosenshine described effective teaching in the following terms:

-- goals are clear to students
-- time allocated for instruction is sufficient and continuous coverage of content is extensive
-- the performance of students is monitored
-- questions are at a low cognitive level so that students can produce many correct responses
-- feedback to students is immediate and academic oriented interaction is characterized as structured, but not authoritarian (Rosenshine, 1979).

Medley described the situation in slightly different terms when he stated:

> How to maintain an orderly and supportive classroom climate, how to increase the amount of time devoted to learning activities, and how to improve the quality of learning activities--all three are determined largely by what the teacher does, and research provides detailed information about how teachers behave who do them successfully.... The research strongly indicates that a substantial, if not dramatic, improvement in achievement, in attitudes toward school, and of <u>disadvantaged</u> pupils' self-images would result (Medley, 1979, p. 25).

Time

That students learn what they are taught is hardly a startling research finding. Learning is related to the content covered (Wright & Nuthall, 1970; Fitz-Gibbon & Clark, 1982). As Brophy and Good (1986) have stated, "Amount learned is related to opportunity to learn, whether measured in terms of pages of curriculum covered or percentage of test items taught through lecture or recitation" (p. 360). It has also been found that the amount of time, assuming that it is of high quality, is a useful surrogate for measuring the amount of content covered (Armento, 1975; Rosenshine, 1979). Corno concluded, "Time becomes the most immediately promising focal point in the effort to improve achievement"

Perhaps no area of research shows more dramatically the confirming effect of research than the studies conducted on the amount of time devoted to instruction. In the early studies by Harris and Serwer (1966) and by Soar (1970), the conclusion was that instructional time spent on reading, not time spent in reading-related activities, was positively correlated with reading achievement. Spending time on noneducational tasks leads to lower achievement (Larrivee & Algina, 1983). McDonald has put it, if students have not been taught...some...content or procedure, they simply do not do well on those portions of the test relevant to that topic (McDonald, 1976, p. 27). "Time spent engaged in relevant content appears to be essential for achievement" (Rosenshine, 1979, p. 47).

On the other hand, time is not enough. The above paragraph infers that the time spent must be of high quality (Fisher, et al., 1980). Time is not related to achievement in any simple or direct way (Karweit, 1983). Merely allocating time to a subject is not as important as what

happens during that time. What teachers choose to emphasize in their classroom is more important than a school-wide policy regarding the amount of time allocated to a particular subject. Brophy and Good (1987) have said, "Some teachers who allocate less time for a subject have considerably higher rates of academic learning time because they involve students more in appropriate tasks" (p. 36).

But, time spent must also be on tasks that are not so difficult that students can not learn them, or so easy that students are not challenged (Berliner, 1979; Clark & Yinger, 1976). Likewise, there is probably a point of diminishing return. Goodlad (1979) questions whether or not it is possible to increase endlessly "time on task." Surprisingly, he limits the amount of time that a student can be engaged in real learning of specific content to no more than two or three hours per day.

An issue related to the amount of time, and the quality of that time, devoted to instruction is the length of the pause between asking a question and requiring a response from students, commonly referred to as "wait-time." Teachers use many questions in the course of the day. (See section on Questioning.) The tendency for teachers is to call for an answer almost immediately upon asking a question. Nevertheless, research has shown that waiting just a few seconds before calling upon a student has many benefits (Tobin & Capie, 1982). The quality of students' responses is raised and more students are likely to participate in answering the question asked. This is especially true when more difficult questions are asked (Brophy & Good, 1986). On the other hand, waiting too long can have detrimental effects. Research has also shown that it is important for teachers to keep discussion moving

at a brisk pace. (See section on Structuring of Lessons.) A balance is needed between pausing long enough to allow students sufficient time to think and moving the discussion along.

Structuring of Lessons

Evidence from the product-process research shows that effective teachers structure their lessons (Brophy & Good, 1986; Wright & Nuthall, 1970). Learning is enhanced; and frustration is reduced. Insufficient or ineffective presentations of the content of lessons result in confusion, students having to ask unnecessary questions, and wasting time. Effective teachers clearly explain things. "Clarity of presentation is one of the more consistent correlates of achievement" (Brophy & Good, 1986, p. 354). The structuring of optional lessons for clarity include the following:

- providing overviews of what is to be learned (through the use of previews, advanced organizers, or statements of objectives)
- outlining content
- signaling transitions between parts
- focusing on main ideas
- relating new information to what has been learned previously
- giving examples
- summarizing subparts
- reviewing main ideas at the end.

Lack of clarity is related to the use of vague terms (such as might, usually, a few, probably), false starts (such as halts in speech, tangles of words, incomplete and garbled sentences, and the overuse of "uh"), and irrelevant content.

The level of difficulty is associated with clarity and lessons, therefore, must be at an appropriate level. They must have meaning to the students. Low error rates correlate positively with achievement, while high and even moderate error rates correlate negatively (Rosenshine, 1979, p. 44). These findings led to the conclusion that instruction is best when it allows students to provide mainly correct responses with very few errors. Evertson and Emmer (1982) concluded that assignments must be easy enough to assure success, but challenging enough so students are not bored.

Berliner and Tikunoff (1977) showed that effective teachers used a mixture of high- and moderate-success, and avoided low-success, activities; and Good, Grouws and Ebmeier (1983) found that effective teachers asked few questions yielding incorrect answers, but when students answered incorrectly, feedback was given in such a way as to help students understand why their responses were in error.

Although not related directly to clarity, an aspect of effective teaching is structuring the lesson at an appropriate pace. A relative rapid pace is best (Good, 1983), but not at such a rapid pace that the teacher does not have enough time to think and adjust instruction as needed. "Optional learning occurs when students move at a brisk pace but in small steps...with high success rates...." (Brophy & Good, 1986, p. 341).

Questioning

The thinking among educators has been that teachers can control the quality of the performance and learning of children in instruction through the use of questions. Questions, it is claimed, stimulate

student thought and participation in learning activities (Dillon, 1978). Hyman (1979) writes, "It [a question] prods the respondent to think so as to supply a response, and it directs that respondent to think about a particular topic" (p. 1). Higher level questions are supposed to stimulate higher thought (Blosser, 1973). Questions are thought to motivate, promote thinking, involve more students than just the one answering the question, and evaluate (Davies, 1981). They help students to evaluate and adjust their own thinking (Wain, 1981) and help students to translate new knowledge into their own ways of thinking (Anderson & Pearson, 1984). Brophy (1979) concludes that asking many questions is related to students' learning more.

Research reveals: teachers ask questions at the rate of about sixty per thirty-minute period (Morrison, 1968); teachers use predominantly lower-level questions (Guszak, 1967); and, when teachers ask high-order questions, the questions are too difficult, forcing children to make errors, but with teachers ignoring the answers children give (Browne, 1971; Guszak, 1976). More recent studies provided the following results: teachers should wait at least three seconds for a pupil to respond to a question (Rowe, 1974); if a child does not respond after a reasonable amount of time, teachers should indicate that some response is expected (Anderson, Evertson & Brophy, 1979); eighty-five percent of the time in classrooms after a student answers a question, the teacher will ask another question (Mishler, 1975); typically, a teacher waits less than a second after a pupil has answered a question before asking the next question (Rowe, 1974); just asking children to sit and think about the answer to a question is negatively related to achievement (Soar & Soar, 1979); it is better that low socioeconomic

children are asked questions that they can answer correctly, but having high socioeconomic status children being asked some questions that they cannot answer correlates positively with achievement (Brophy & Evertson, 1974); and, most teachers ask pupils questions that they can answer easily (Anderson, Evertson & Brophy, 1979).

Considerable study has been made of the type of questions that result in the greatest amount of gains in achievement. Stallings and Kaskowitz (1972-73) and Brophy (1979) investigations showed that direct questions with an academic focus are positively related to gains; and open-ended questions that encourage synthesis and analysis are negatively related to learning (Davies, 1981). Soar determined that questions with a single answer are positively related; and divergent, open-ended questions are negatively related to achievement (Soar, 1973; Good, Grouws, & Ebmeier, 1983; Larrivee & Algina, 1983; Clasen, 1983; Good, 1983). Dunkin and Biddle (1974), Rosenshine (1976), Winne and Marx (1982), and Redfield and Rousseau (1981) concluded that questions about personal opinion and experience were negatively related and high-level questions were not correlated either negatively or positively with reading achievement. The results are somewhat mixed. Rosenshine has made the following summary:

> The research on types of questions and student achievement remains confusing even after one reads recent studies that incorporated improved design features. The effects of high-order questions are nowhere to be seen, or are the effects of lower-order questions as clear as one would wish. And the few studies on ratios of higher to lower-order questions have not been any more revealing. The results are best stated as trends: lower-order questions tend to be positively related to achievement; higher-order questions tend to be unrelated, and personal questions tend to be negatively related (Rosenshine, 1976, p. 358).

Nevertheless, asking high-level questions seems not to be functional for lower-grade pupils (Soar & Soar, 1979). There seems to be little point in asking difficult or complex questions (Brophy, 1979). Medley has summarized the findings succinctly when he states:

> He or she (effective teacher) does not encourage pupils to analyze, synthesize, evaluate, or indeed to do anything but answer rather narrow questions asked by the teachers. The teacher who encourages such pupils to express themselves freely, to think, to question, to discuss, is not effective (Medley, 1977, p. 16).

Teachers seem to have a commitment to the specific and literal aspects of learning (Emans & Fox, 1974). Accepting Medley's and others' conclusions would seem to suggest that teachers were right in holding to such a belief. The implications of the research reported here are too important to accept without considerable exploration and debate.

The first issue that is not clear from reading the research studies on questioning, and that probably must be clarified before any firm conclusions can be drawn, is the content of the questions that are used. Most of the research conducted to date on questioning have involved the primary grades. An emphasis of beginning reading is on decoding. Chall (1967), as reported in a study by Dykstra (1968), found that a code emphasis in the early grades results in greater reaching achievement. Not clear from the literature on questioning is whether or not researchers made a clear distinction between questions focused on decoding and those focused on comprehension. Rosenshine (1979) hinted that researchers considered only comprehension questions. If this is true, this particular concern would be answered. But, it is not clear from reading the research studies that a distinction was actually made. If a distinction were not made, the findings from the research on

questioning may only be a confirmation that a decoding emphasis is important for beginning reading instruction.

Assuming that a researcher focused on comprehension rather than decoding questions, a number of other concerns remain. Of course, teachers can ask questions that are too difficult for children. Their minds are not yet well developed. There is a need to formulate higher-level questions that are appropriate for children. That this is not being done, does not mean that it could not be done. As Winne and Marx have written, "Students simply do not perceive what mental activities the teacher intends to invoke by such (complex) questions" (Winne & Marx, 1979, p. 222). Doyle has expressed the view that "It may well be that task structures requiring comprehension are difficult to implement because of the nature of classroom processes" (Doyle, 1979, p. 201). The implication is that it may be possible to change classroom processes, like teacher control, so that higher-level questions would become more effective learning aids.

A third concern involves the instrumentation used to measure achievement. Most reading tests use questions. The asking of many questions during instruction may only be preparing pupils to answer better the questions asked on tests and may not actually be fostering comprehension. If instrumentation without questions had been used to measure achievement (for example, cloze tests), the results may have been different.

Another concern is that there is no magic in questions themselves; but that how they are used is important. Asking questions is not teaching, but evaluating. Implementing the results of research on questioning in the classroom may, in the long run, lead to less

instruction, not more. Durkin's research is especially pertinent to this issue. She concluded:

1. Practically no comprehension instruction was seen. Comprehension assessment, carried on for the most part through interrogation, was common. Whether children's answers were right or wrong was the big concern.

2. In addition to being interrogators, teachers also turned out to be assignment-givers. As a result, time spent on giving, completing and checking assignments consumed a large part of the observed periods.

3. Other kinds of instruction were not seen with any frequency either (Durkin, 1978-79, p. 520).

In addition, researchers on questions may be making unwarranted assumptions. One assumption is that questions thought to be at a high level are actually at a high level; and low level questions are actually at a low level. All reading comprehension involves complex thought, even when evaluated by recall questions. As Rothkopf has said, "The translation of written language into a useful internal representation obviously requires the exercise of highly skilled processing activities...." There is evidence that "instructional materials, even in the early grades, places extraordinarily complex demands on students (Rothkopf, 1976, p. 110). The level of reading material does not predestine the questions that teachers use. Teachers can ask simple questions about complex passages and complex questions about simple passages (Doyle, 1979). Long, complex questions can be answered with simple yes/no, exclamations, and even other questions (Dillon, 1978). Furthermore, the reactions a question causes in someone else cannot be decided by looking at the question (Dillon, 1978, p. 53).

Perhaps most importantly, there is no empirical evidence for an hierarchical ordering of questions -- only the abstractions defined by adult logic. Rosenshine (1976) recognizes the need to study the

appropriateness of various higher-level questions. A question soliciting personal opinion is often considered to be of a higher order -- but it may actually require very little mental effort on the part of the respondent, only an emotional response. What may be considered to be low-level questions may actually require considerable thought. For example, grasping the main idea of a passage is generally referred to as a low-level question, but it requires the synthesis of ideas. Providing a title for a story requires the synthesis of ideas and creativity in formulating an attention-getting summary in the form of a title. Recognizing details may or may not involve judging what is important to remember. Following simple directions requires the grasping of purpose, the recognition of detail, the ordering of events, the prediction of outcomes, and probably more.

Perhaps the most significant works on questioning are those that question the validity of using questions at all for instruction. Having to remember the questions that a teacher asks, or worse, having to anticipate what questions the teacher may ask, may place too many demands upon readers' mental processes and prevent them from concentrating on the meaning of a passage. This may explain why SQ3R of Survey, Question, Read, Recite, and Review (Robinson, 1962) and similar systematic study procedures do not turn out to be effective instructive devices in practice, although there is much research evidence to support the view that they should. As Rothkopf has written:

> Environmental demands made during reading, such as questions, change what is learned from reading a passage.... These results suggest that written lists of directions sometimes results in mental bookkeeping problems and a resultant drop in efficiency (Rothkopf, 1976, pp. 119-20).

There is some empirical evidence to support these contentions (Winne & Marx, 1979).

The work of individuals such as Dillon raises serious concerns about the use of questions. He cites evidence from personnel interviewers, group work, linguistic field researchers, and psychotherapists that questioning has negative influences (Dillon, 1978). Lopez, a specialist on interviewing has said, "The use of direct questions are to be avoided whenever possible" (Lopez, 1965, p. 252). Yamada, in 1913, held the view that to rely on questions "is to make children passive and halting in their self-expression and independent mental activity" (Yamada, 1913, p. 147). There is evidence that teacher questioning suppresses thought (Dillon, 1978). It is hard to escape the conclusion that individually directed questions inhibit responses in the child (Boggs, 1972). Gall agrees: "We have only a slim basis for asserting that any questioning strategy affects student behavior positively (Gall, 1973, p. 39). Dillon concludes that questioning:

-- threatens the individual
-- interrupts thought
-- causes participants to be ready with a response in case they are called upon, instead of thinking about the problem (Dillon, September-October, 1981).

"Why" questions are especially damaging in the climate of contemporary classrooms as they are often ambiguous. They may call upon the respondent to reason, show cause, justify, or describe a process and "function to express such things as objectives, disapproval, criticism; and the reaction is to defend, withdraw, or attack" (Dillon, November-December, 1981, p. 18). In summary, Dillon states:

> A question-answer relationship fosters in the respondent dependency, passivity, and reactivity.... He answers when asked and otherwise keeps his mouth closed -- undoubtedly his mind and heart as well.... As a consequence, responses

> tend to become shorter and shorter as further questions are put.... The outcome of a question-answer relationship is usually an evaluative and authoritative decision on the part of the questioner (Dillon, September-October, 1981, p. 53).

Teachers' use of questions may be more influenced by their need to control classroom behavior of students than it is to enhance learning. As Dillon warns:

> The teacher may revert to questioning in order to regain control of the class.... Teacher questioning is an effective means to get them under control -- it elicits attention, directs effort, specifies content, demands response, and so forth. Questioners are always the boss.... This attractive feature may account in part for the predominant use which teachers make of questions.... (Dillon, September-October, 1981, p. 55).

Therefore, when questions are used, they must be clear, asked one at a time, and at an appropriate level of difficulty (Wright & Nuthall, 1970). This is easier said than done.

Classroom Management Research

Overview

Good classroom management has come to be equated with good teaching (Brophy, 1979). "Much research indicates that teachers who are good classroom managers also tend to produce more student learning" (Brophy & Putman, 1979, p. 187). This point of view can be found in much of the professional literature (Anderson, Evertson & Brophy, 1979; Medley, 1979; Rosenshine, 1976; Soloman & Kendall, 1976; Stallings & Kaskowitz, 1972-1973). Soloman and Kendall (1976) found that teacher control and orderliness are positively related to achievement. Studies by Bennett, et al., (1976) and by Wright (1975) concluded that less structure resulted in more student anxiety. Rosenshine (1979) and Anderson, et al., (1979) concluded that direct teacher supervision is important.

Soloman and Kendall (1976) found the successful teachers to be strong leaders, giving pupils little freedom of choice, as did Soar and Soar (1979) and Brophy (1979). Summarizing much of the research on the topic, Soar and Soar state:

> Greater amount of freedom of behavior are associated with a decrease in the amount of learning.... A teacher should limit pupil freedom to move about, to form subgroups, and to socialize.... A teacher [should] establish [at least] a minimum [amount] of structure (Soar and Soar, 1979, p. 117).

In addition, they go on to say, "an attempt by the teacher to stop all physical movement or to direct activities of pupils one step at a time was negatively related to a factorially derived measure of complex achievement." "Authoritarian, punitive, or other negativistic approaches to classroom management never succeed very well" (Brophy & Putman, 1979).

As indicated previously by Soar and Soar, the choice of educational goals seem to be influenced to the amount of control desired by the teachers and school administrators.

> The differences were consistent with the interpretation that greater amount of pupil freedom were functional for complex, high cognitive-level learning objectives, but lesser amount of pupil freedom were functional for simpler, low-cognitive-level outcomes (Soar & Soar, 1979, p. 116).

Rosenshine expressed similar concerns (Rosenshine, 1979). But Soar and Soar warns that "the typical teacher does not distinguish the management of behavior from the management of learning tasks or the management of thinking" (Soar & Soar, 1979, p. 109).

Not only does the literature relate the amount of teacher control and pupil freedom to differing educational objectives; but it also relates control-freedom to different populations (Good, 1979). "Approaches to classroom management must be suited to the developmental

level of the students if they are to be effective" (Brophy & Putman, 1979, p. 193). Fisher, et al., (1978) showed that more teacher control may be desirable for the lower grades than for the upper grades. And Brophy (1979) concluded that more structure is needed for anxious students.

Finally, in considering the literature on teacher control of pupil behavior, the number of different activities and their complexity must also be a consideration. Many activities going on at the same time are negatively related to pupil achievement; classrooms are more disorderly; and students are less attentive (Rosenshine, 1979). Varied and complex materials and activities create more complexity to be managed by the teacher. The teacher has to be especially competent in such circumstances or learning may suffer (Doyle, 1979). Complexity in instructional organization may not be beneficial (Cohen, et al., 1979).

Implementation of Classroom Management Research

Good classroom management leads to more learning; poor classroom management leads to less learning (Coker, Medley & Soar, 1980; Good, Grouws & Ebmeier, 1983; Good & Brophy, 1987). As Brophy and Good (1986) state,

> The largest adjusted achievement gains occurred in classes of teachers who were well organized, who maximized the time devoted to instruction and minimized time devoted to preparation, procedure, or discipline, and who spent most of their time actively instructing the students and monitoring their seatwork (p. 350).

Soar and Soar (1979) found that effective teachers limited pupil freedom of choice, restricted physical movement, allowed fewer disruptions, controlled pupil's behavior and talked more -- but only up to a point of diminishing returns where too much teacher control had a

negative effect. Good and Brophy (1987) concluded that effective teachers organized and managed an efficient classroom, gave students tasks at appropriate levels, focused on worthwhile academic objectives, and used a balanced approval to motivation. According to Brophy and Good (1986), indicators of effective management included: adequate preparation, the installation of rules and procedures, a brisk pace, the use of appropriate challenges that assured success, following-up on seatwork and assignments, and clear presentations. Some of these research findings have been summarized in the section on Time, Structuring of Lessons, and Questioning. Some will be summarized in the following section on Climate. These findings will not be repeated in this section except for purpose of emphasis.

Effective teachers allowed fewer disruptions of all types than less effective teachers (Good, Grouws, & Ebmeier, 1983), and interrupted less what they were doing for matters related to student misconduct (Larrivee & Algina, 1983). They were less likely to switch back and forth between instruction and behavioral management (Berliner & Tikunoff, 1977). Good teachers prevent student misbehaviors (Good, 1983). They limit opportunities for students to be disruptive by anticipating problems (Kounin, 1970). They were engaged in continuous monitoring (Copeland, 1983; Doyle, 1979; Evertson, Anderson, & Brophy, 1978), even up to the point of setting themselves in positions where they could observe and monitor the entire class while working with small groups (Brophy, 1979). They frequently moved around the class checking seatwork and course assignments (Kounin, 1970; Evertson & Emmer, 1982). Good teachers used less time on transactions -- going from one activity to another and

clearly communicated when such transitions were taking place (Brophy, 1979; Larrivee & Algina, 1983; Doyle, 1984).

A key to success in classroom management is establishing clear and consistent routines so students know what to do and when (Brophy, 1983; Rogoff & Wertsch, 1984). Failure to have routines result in disorder and create opportunities for misbehavior requiring unnecessary disciplinary actions on the part of teachers (Leinhardt, Zigmond & Cooley, 1981). Students need to know what are acceptable and unacceptable physical movements, the locations of materials and supplies, and what behaviors the teacher expects, e.g., how to hand in assignments, how to line-up for dismissal, and how books are to be distributed (Brophy, 1983). Routines make it possible to have a number of activities going on simultaneously (Doyle, 1985). On the other hand, too many rules, or unnecessary rules, are also disruptive. There needs to be just enough so that students know what to expect. Enforcement of rules and routines should not be punitive.

An area in respect to classroom management in which process-product research has been able to make an especially significant contribution is related to whole class instruction versus group and individual instruction. In the past, the conventional wisdom has been that small group and children working on individual assignments produces better learning than teacher instructing the class as a whole. The evidence still supports the need for a variety of activities, as long as there are not so many activities that children are confused, but what is not supported by research is the need to have many different activities being conducted simultaneously (Doyle, 1985).

Few teachers seem to be able to conduct successfully many different activities going on at the same time. Whole classroom instruction helps teachers to maintain control (Berliner & Tikunoff, 1977). Whole class instruction works well (Good, Grouws & Ebmeier, 1983; Berliner & Tikunoff, 1977; Brophy, 1983), and instructing small groups produces better results than a teacher working with just one or two children at a time (Good, 1983). This is especially true for low-achieving students (Stallings, Needels, & Stayrook, 1979). As Brophy and Good state, "Students achieve more in classes where they spend most of their time being taught or supervised by their teachers rather than working on their own" (p. 361). Teacher talk is related positively to student achievement. The research evidence is that teacher talk is neither oppressive nor unduly dominant in itself (Flanders, 1970).

Teachers need to correct individual student responses when they are in error (Larrivee & Algina, 1983). Effective teachers give remedial help when needed (Good & Brophy, 1983). Effective teachers are less likely than ineffective teachers to assign busy-work merely to keep students occupied (Berliner & Tikunoff, 1977). Seatwork is often overused, but is needed to provide practice and opportunities to use ideas (Brophy & Good, 1986). It needs to be varied, have clear instructions, closely monitored, frequently checked, and feedback provided. Short, frequent contacts by the teacher is better than larger, less frequent contact (Good, 1979). It must be well matched to students' abilities. Thus, some individualization is required (Evertson & Emmer, 1982).

One of the most surprising finding is that patterned turned (the old round robin) produces better results than calling on students

randomly or asking for response from volunteers (Brophy & Good, 1986). Pattern turns provides the opportunity for all students to participate regularly and equally. It avoids students attempting to get the teacher's attention in order to volunteer. Perhaps most importantly, it routinizes procedures by providing structure and productability, and, thereby, reduces student anxiety.

A Cautionary Note About Classroom Management Research

Duke writes, "Classroom control is no longer regarded as a means to an end, but as an end in itself" (Duke, 1979, p. 362). Even more distressing is the recent research indicating that adults in industrial societies are hostile and punitive toward children (Phillips, 1982). The early work on teaching styles (democratic, authoritarian, and laissez-faire) seems to have been swept aside as being inconsequential. "Terms like 'pupil centered,' 'democratic,' or 'permissive' as descriptions of classroom behavior are too global and nonspecific to be useful" (Soar & Soar, 1979, p. 118). However, the early work of Lewin, Lippit and White (1939) is so compelling that it should be incorporated into any interpretation of modern-day research on teaching. Their leadership studies provided separate club groups of eleven-year-old boys with three different kinds of leadership: democratic, laissez-faire, and autocratic.

Democratic leaders evolved club policies by guiding discussion among club members. All club activities were explained and clarified by the leader and alternative procedures were suggested. Leaders provided only objective praise and blame, i.e., task relevant. The leader interacted as though he were a regular, but not central, group member.

Members of the democratic group were cooperative and voluntarily work-centered. Inter-member conflicts were readily resolved and contacts with the leader were friendly and work related. Post-meeting behavior was calm.

Autocratic leaders imposed their own policies on the group. They predetermined the steps of the task and assigned them one step at a time to the members. They dictated the procedures to be followed. They provided no overall view of the task for the members. The basis for the leaders' praise and blame was not stated; it reflected personal rather than objective standards. The leader remained aloof from the activities, except when demonstrating. The autocratic group members developed little commitment to the task; they performed each step in robot-like fashion and became distracted when the leader left the room. The members were rivalrous and scapegoated various members and the leader. Group meetings often ended with explosive bursts of rowdiness.

All policies established in the laissez-faire group were supplied by the members. The leader described the resources and gave information only on request. The leader provided no evaluation. He was neutral. Laissez-faire club members sought information from their leader and looked to him and one another for personal attention and approval. This group was the least productive of the three. The members of the group were more active, but not at the task, when the leader was out of the room than when he was in it.

Many of the classrooms studied in process-product research may have had laissez-faire or autocratic, rather than democratic teachers. Uninvolved and inactive teachers may have conducted classrooms where students did not learn, never developed an interest in the subject

matter, and sought attention and approval for social rather than productive reasons.

Autocratic teachers may result in high levels of student performance as both the leadership studies and the process-product studies reveal. But democratic leaders may also be productive, as reported by Lewin, Lippitt and White. Autocratic leadership, however, also produces conflicts which result in interpersonal as well as task management problems.

Management problems of student behaviors seem to be a major concern of present-day teachers. The process-product studies seem to be designed to help teachers to handle management problems by giving them tools to shore up their classroom autocracies. A question that needs to be asked is, "If teachers become autocratic enough, will students become only compliant and, perhaps, even apathetic?" So preoccupied are process-product researchers with providing teachers with the means to control and manage students and learning that they may be failing to study sufficiently how to develop "good students"--students who are eager to learn, who are rewarded by having learned, and who respect (admire, not fear) teachers for the help they can give them. The next section, which summarizes the process-product research on Classroom Climate, may provide some clues as to how this dilemma can be resolved.

Classroom Climate

The overall climate of the classroom has been a source of speculation and of interest to researchers for years. Process-product research has been successful in giving some insights. Wallen (1968) has provided evidence that children achieved less well under controlling

teachers than teachers permitting some freedom. Teachers focusing on authority and discipline have been found to be ineffective in promoting academic achievement (Flander, 1970; Brophy, 1983). Yet, an excessive warm climate has not been related to increased achievement either (Rouk, 1979). Warmth seems to be related more to positive attitudes than academic success (Brophy & Putman, 1979). The general conclusion has been that a neutral climate is best where teachers are business-like, enthusiastic, non-evaluative, objective, relaxed, and believe that their students are capable of learning (Soar, 1968; Brophy & Good, 1986; Wright & Nuthall, 1970; Doyle, 1985; Good, 1983). Climate involves issues related to praise and criticisms, the use of competition, and teacher expectations.

The research on teacher praise and criticism of pupil behavior has produced unclear results. This is probably because the effect of the emotional climate in the classroom is extremely complex. A series of studies (Chall & Feldmann, 1966; Soar, 1968; Wallen, 1966) came to apparent contradictory conclusions regarding the effect of teacher praise and criticism. Harris, et al., (1968) found that both too much praise and too much criticism could lead to lowered achievements.

An overemphasis on praise can lead to lower achievement (Coker, Medley & Soar, 1980; Medley, 1977). It can embarrass students. When students are praised they should be praised privately (Good & Brophy, 1987). "Empty reassurances or a few words of encouragement will not do the job" (Good & Brophy, 1987, p. 318). Students need help and opportunities to success. Feedback does not require praise (Brophy & Good, 1986; Good, Grouws, & Ebmeier, 1983). Good (1979) found that ineffective teachers praised incorrect answers; and Anderson, et al.,

(1979) concluded that when a pupil gives correct responses teachers should say nothing but continue the lesson in an effort to keep it going at a smooth pace.

Negative criticism includes the use of sarcasm, reprimands, personal attacks, accusations, and ignoring the student all together. Less effective teachers "tended to ignore, belittle, harass, put down, or exclude their students" (Brophy & Good, 1986, p. 351). More effective teachers were polite and pleasant to their students. Soar found that some criticism could result in achievement in beginning reading skills; but it was counterproductive for vocabulary development and learning of abstractions (Soar, 1968). Rosenshine and Furst (1973) and Dunkin and Biddle (1974) concluded that criticism was negatively related to learning and praise was neither positively or negatively related. Brophy and Evertson (1974) found that neither praise nor criticism was negatively or positively related for low socioeconomic status children; but criticism was positively related for high socioeconomic status children. Other investigators found praise to be positively related. Soloman and Kendall (1976) concluded that "The avoidance of negative affect is important to pupil gain, but the expression of positive affect is not related." And Brophy (1979) states, "Praise seems to be generally overrated, although it does seem important for less ability/anxious/dependent students, provided that it is genuine and deserved and the praiseworthy aspects of the performance are specific."

Thus, it seems that the effectiveness of both praise and criticism seems to depend upon how they are used and with whom. Stallings and Kaskowitz (1972-73) believe that praise and criticism must have an

academic focus and not be used in respect to general behavior. Anderson, Evertson, and Brophy (1979) concluded that criticism is of value when it is specific, includes the correct alternative, and used in moderation. Brophy and Putman believe that praise must be "sincere, adapted to the specific accomplishments in question, adapted to the preferences of the individual student, and specific in describing exactly what the student did that was praiseworthy" (Brophy & Putman, 1979, p. 205). Eden (1975) believes that the child must value praise in order for it to be effective.

The use of praise is especially complex as it is personal rather than objective. Doyle (1979) cites references that praise from teachers has little relationship to students' responses. Perhaps praise suggests to the child that he will be respected only if he performs in the way the teacher likes rather than according to his own judgement of what is right. The above evident is probably best summarized by the familiar adage that we can dislike a child's behavior but not the child, if we are to help him or her learn. Learners do need to feel free to make mistakes believing that teachers do not reject children, only their errors.

An issue similar to praise is the use of competition. Competition seems to be an integral part of the American culture, at least a large segment of it. At the same time, competition has been found to be harmful in the learning environment. In the long run, it is self-defeating--for every winner, there is a loser (Good & Brophy, 1987). It risks public failure. It is better to emphasize mastery of learning than to make comparisons among students (McColskey & Leary, 1985). Competition can be subtle, as well as obvious, and can be seen

in ability group, grading practices, public charts of student progress, and calling attention to exemplary behavior (Ames & Ames, 1984).

There has been much research on teacher expectation of student success and their academic achievement. Although the early work of Rosenthal's Pygmalion in the Classroom has resulted in much criticism and controversy and involved tests of intelligence, much of the more recent research on teacher expectations has dealt with academic achievement and would appear to provide important findings. The research has stimulated so much reaction that those people with a bent toward defending teachers as a group oppose the findings and those people with a bent toward criticizing teachers as a group support the findings. "Some investigators hinted at the possibility of the child's behavior as the initiator of the action in the classroom" (Emans & Fox, 1974,, p. 57). Wallen (1966), Kendrick and Bennett (1966) and Morrison (1968) observed that effective teaching behavior must be interactive and take account of the receiver as well as the initiator. The work of Doyle (1979) has shown that students influence the behavior of teachers as well as that teachers influence the behavior of students; "Students have a significant impact on the learning opportunities given them and how teachers treat them" (Doyle, 1979, p. 187). Citing the work of Doyle and the results of his own study, Copeland conceded: "The teaching-learning behaviors that occur in any classroom may be seen as the products of interactions of the inhabitants of that classroom...teachers' behaviors are as likely to be the products of pupils' actions as to be their cause" (Copeland, 1980, p. 163). Both Dusek (1975) and Cooper (1977) have provided detailed reviews of the

extensive research literature on teacher expectations and pupil achievement. Dusek summarizes the findings:

> Evidence indicating that teachers do form expectations for students' performance is abundant. Teachers tend to treat students differently depending upon their expectations for the students' performance. These expectancies, and presumably their behavioral manifestations, have been shown to relate to students' academic achievement.... To the extent that teachers' self-generated expectancies...are based on sound, objective data regarding students' abilities, then the teacher is not biasing students' education. Rather the teacher's differential behavior toward the students in the classroom may reflect effective teaching-style differences for students with differing needs. However, if these expectancies are based on impressions or information irrelevant to academic success then the teacher's expectancies may cause some students to be treated in a manner that...may contribute to their doing poorly in terms of academic achievement (Dusek, 1975, p. 680).

An indisputable conclusion from the research surveyed is that teachers treat different children differently. Whether this is good or bad will be discussed later; but teachers do often treat girls differently from boys, high achievers differently from low achievers, and high socioeconomic status children differently from low socioeconomic status children (Cooper, 1979). Teachers criticize girls less than boys, but praise boys more (Brophy & Good, 1970). Teacher praise low socioeconomic status children less than high socioeconomic status children; yet they seem also less likely to criticize low socioeconomic status children (Medley, 1979). The work of David and Dollard is described as determining that lower-class children gather most of the teacher's corrections, while higher-class children reap the rewards (Good, 1970). Teachers allowed high achieving children to make open answers but required low achieving children to be specific and literal in their responses, and give more autonomy to high achieving children while giving more direction to lows (Brown, 1971). These

findings have been substantiated by later research (Copeland, 1980). Teachers talked one-half to three-fourths of the time while instructing low achieving children, but only one-fourth of the time to high achieving children (Borke, Shavelson & Stern, 1981). They tend to choose more abstract materials for high achieving children; but the opposite is true for low achieving children (Borke, Shavelson & Stern, 1981). Good (1981) cites the following ways teachers vary their behavior toward those judged as slower students:

-- seating them father away from the teacher
-- pay less attention to them - smiling at them less
-- call on them less often
-- wait less for them to respond to questions
-- criticize them more
-- praise them less
-- provide them with less feedback
-- demand less effort from them
-- interrupt them more often.

Thus, a safe conclusion is that teachers provide different learning opportunities for high and low groups according to their perception of their students' abilities.

It can be argued that teachers should treat different children differently. Treating children differently is a way of providing for individual differences. But, the concern is whether or not treating children differently results in greater or less achievement. For example, Brophy and Evertson (1979) conclude that calling on another student to supply a correct answer when a child has failed to do so will have a negative effect on the learning of low socioeconomic children but

a positive effect on the learning of high socioeconomic children. Albeit, the finding of Chall and Feldmann (1966) that there are individual differences which, when attended to, do in fact lead to lower achievement is born out by the more recent research evidence. Studies (Allington, 1980) have shown that teachers are more likely to interrupt poor readers who err than good readers who do--even when the types of errors are the same. They are more likely to draw the attention of poor readers to graphic-phonic correspondences than they are good readers; yet they are more likely to draw the attention of better readers to the meaning of a passage. These findings are especially significant in the light of Chall and Feldmann's (1966) conclusion that a meaning emphasis on the part of teachers is positively related to achievement.

The expectation that teachers have regarding how well children will learn does have an effect on children's achievement (Brophy, 1979; Brown & Sherbenou, 1981; Cooper, 1979). Much of the research on expectation indicates its effect on student motivation. As Cooper has said:

> Student performance differences...can be viewed as sustaining low teacher expectations.... Poor performance and low expectations continue: teacher control over low-expectation interaction is increased through inhibition of slow student initiations (Cooper, 1979, p. 403).

The amount of criticism that teachers give affect motivation. High criticism results in low motivation and the amount of teacher help pupils seek; reducing criticism increases student-initiated interactions (Cooper, 1977). Students who persist at a task are more likely to hold the view that success is related more to effort than ability (Dweck & Reppucci, 1973). This finding is significant in the light of the findings that teachers are more critical of boys than they are of girls; but teacher criticism of boys is of a different kind than that of girls.

Boys come to view teacher criticism as related to lack of effort and not their ability; while the opposite is true of girls. As a result, girls become more dependent upon teacher approval than boys (Dweck, et al., 1978).

How teachers group children is also associated with teacher expectations and pupil success. Teachers group children according to subjective evidence (Dusek, 1975); but a child placed

> into the low-ability group is virtually certain to stay there, even though the reasons for that assignment often have nothing to do with ability.... The poorly behaved student is likely to wind up in the low reading group, regardless of ability. [And] any student, capable or not, will perform below potential in an environment where most learners are doing poorly (Calfee & Brown, 1979, pp. 151-157).

Thus, the inescapable conclusion is that children are often grouped (informally or formally) not in accordance to their abilities but by subjective criteria unrelated to academic achievement. Teachers treat children differently according to how they categorize them in their informal or formal groupings; and this treatment influences how well children achieve. The evidence is that this is true with some teachers, but not all.

The findings that teachers treat boys and girls differently, and the finding of more recent studies that teachers criticize girls less even for the same misbehavior (Dweck, et al., 1978), provide evidence that teachers use subjective evidence in viewing children. "That noncontingent reinforcement [based on neatness, following instruction, speaking clearly] does lead to performance deterioration is well documented" (Cooper, 1979, p. 402). Certain teacher personality characteristics seem to predispose teachers to behave differently toward various students with specific traits (Rubovitz & Maehr, 1973).

Numerous studies have shown that teachers are frequently poor judges of pupils' abilities (Bray & Estes, 1975; Brown & Sherbenou, 1981; Clark & Yinger, 1979; Doyle, 1979; Katelis, 1975; Marx, 1978); and they do not improve in their judgements when they get to know their pupils better (Jecker, et al., 1964). They are able to predict which children will be high achievers; but are unable to distinguish low and average achievers (Clark & Yinger, 1979). Teachers perceive the bulk of their class as reading at grade level even when their children are actually achieving at a considerably higher or lower level (Anastasiow, 1964). Teachers are able to attend only to a few of the many relevant variables in forming their judgements (Borke, et al., 1979). As Brown and Sherbenou have concluded, "Teachers' perception of children's reading ability is more closely related to how the teacher views the children's behavior in class than to actual performance as measured by test (Brown & Sherbenou, 1981, p. 557). Barr (1975) found that teachers formed their expectations by judging which children had difficulty attending to instruction and which were likely to become restless with a pace of instruction that was too slow for them.

The reasons for teachers using subjective evidence unrelated to academic achievement in forming their expectations for children's success in school are important. There is evidence that teachers form their perceptions of children, and their behaviors in treating children differently, even when they are not different, because of the belief they seem to have that good classroom management must take precedence over good classroom learning (Doyle, 1979).

> The way of selecting students to respond appeared to be based on the need to maintain the flow of classroom activity (Doyle, 1979, p. 140).

> Low expectation students, however, may be praised and criticized more often for reasons independent of their personal efforts, namely the teacher's desire to control interaction context.... Teachers perceive the least control over and the least chance of success for interactions initiated by slow students.... [Teacher] control can be minimized over low student performance by inhibiting student initiations.... the teacher can increase personal control through the creation of an unrewarding socioemotional environment and the relatively infrequent use of praise and freer use of criticism in interactions with lows (Cooper, 1979, p. 399-401).

"The greater frequency of criticism that low-expectation students receive [seems to] be related to the teacher's desire for personal rewards (Cooper, 1977, p. 425).

It seems that a paradox is evident. Better lessons are provided for better students; poorer lessons are provided for poorer students; and the gap widens--naturally, not just expectancy, but in reality. Just as a malnourished person should not be maintained on an inferior diet, those learners requiring the most enriched learning must be those that receive it.

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